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NOVEMBER 1.

The President, GENERAL ISAAC J. WISTAR, in the chair.

Nine hundred and twenty persons present.

A paper entitled "Eclogæ Botanicæ, Part I," by Edw. L. Greene was presented for publication.

The following report, succeeded by a lantern exhibition of a collection of illustrative photographs with comments, was read by the author:—

REPORT OF THE OPERATIONS OF THE NORTH
GREENLAND EXPEDITION OF 1891-1892.

To the Academy of Natural Sciences of Philadelphia:—

I beg to submit the following Report of the North Greenland Expedition of 1891-92.

The history of the inception and organization of the expedition is familiar to the Academy, and I need not revert to it here.

The incidents of the upward and return voyages are also in the Academy's possession through the reports of Professor Heilprin, the commander of the two auxiliary expeditions, and my report to the Academy from McCormick Bay, July 29th, 1891. I shall refer to these briefly to make this report cover from start to finish.

The "Kite" with the members of my own expedition: Dr. F. A. Cook and Messrs. Verhoeff, Gibson and Astrup, and my colored boy Henson, besides Mrs. Peary and myself; and Professor Heilprin's party: Drs. Sharp, Holt, Hughes, Burk and Keely, and Messrs. Ashhurst, Mengel and Kennealy, moved out of her Brooklyn dock at 5 P. M., Saturday, June 6th, 1891, and steamed up the East River amid the general salutes of the shipping. On the afternoon of the 11th, she entered Sydney, Cape Breton, to coal, and left again on the evening of the 12th for Godhavn, North Greenland, via the Strait of Belle Isle. After a vexatious delay of four days in the ice which was jammed in the Strait, the expedition arrived at Godhavn on the morning of the 27th. Remaining here until the afternoon of the 29th, to enable the members of the party to examine this interesting locality, the "Kite" started northward again. Upernavik was reached early in the morning of the 1st of July, and was left early in the afternoon of the same day.

The next morning found us at the Duck Islands, where a supply of ducks was laid in, and at night we got under way for the passage of Melville Bay. Up to this time no ice had been met since leaving the Strait. By midnight our further progress was arrested by the ice, and not until July 23rd did the "Kite" get free from it off Conical Rock.

In the meantime I had had the misfortune to have both bones of my right leg broken just above the ankle, by a blow from the iron tiller while the Kite was ramming her way through the ice. This accident occurred on the 11th of July, and from that time until July 27th (when I was carried ashore strapped to a plank), I lay upon my back in the cabin.

Early Saturday morning, July 25th, after futile efforts to force a passage through the ice which still stretched unbroken across Inglefield Gulf, the "Kite" swung around into McCormick Bay, on the north side of Omenak or Murchison Sound, and two boat parties were immediately sent out to reconnoitre the shores of the Bay for a house site. This was soon selected, and the work of erecting the house commenced at once. Fortunately, all the frames had been cut and fitted while we were fast in the Melville Bay ice, before the accident to my leg, and the remainder of the work was comparatively plain sailing.

Monday afternoon I was transferred to my tent on shore, close to the house where I could supervise the work. Two days later, on the 29th of July, all my supplies having been landed, I turned the "Kite" over to Professor Heilprin, and early the next morning (Thursday), she steamed south. During this time, the crew of the "Kite" and Professor Heilprin's party rendered my party much assistance in the work on the house. Saturday the roof was completed, and I was carried in, to escape a furious storm of wind and rain. Tidal and meteorological observations were commenced at once.

On the 12th of August, my house being completed as to the exterior, I sent Gibson, Dr. Cook, Verhoeff and Astrup in the "Faith," Gibson in command, with instructions to go to the great loomerics of Hakluyt Island, and obtain a supply of birds for our winter use; then to search the shores of Northumberland and Herbert for natives, and bring me back a hunter and his family. If no natives were found here, Gibson was to cross Whale Sound to the settlement of Nettilume. In six days the party returned, Gibson

having successfully carried out all my instructions. The construction of a winter stone wall about the house was then commenced, the work on this being varied by seal, deer and walrus hunts, and reconnoissances of the neighboring ice caps by Astrup, on his ski.

Between September 7th and 30th two attempts were made, first by Astrup, Gibson and Verhoeff, then by Astrup and Gibson, to carry out my plan of establishing an autumn advance depot of supplies across Prudhoe Land at the southeast angle of the Humboldt glacier. In the last attempt, the men penetrated an estimated distance of thirty miles, when they were stopped by the condition of the snow. During their absence, I was moving about in the boat, most of the time gathering in deer. Matt, and my native hunter Ikwa, bagging fifteen. After the return of the men from the inland ice, a hunting party was kept almost continually in the field until the middle of November, when the score amounted to thirty-one.

The land had long since been shrouded with snow, and the Bay frozen over. The long winter night was now upon us, the sun having disappeared on the 26th of October; we settled down in comfort and security, with a well stocked larder, to pass lightly through it. Constant occupation, first in the little fittings about home, then in the construction of ski and sledges, varied by daily exercise, the visits of the natives, and the pleasant breaks of Thanksgiving and the Christmas holidays, congenial companionship and the best of food, carried us quickly through the somber darkness. Never was there a happier Arctic family than ours; the first sound to greet my ears from the boys' apartment in the morning was a laugh, and a laugh was the last thing I heard at night.

The return of the sun about the middle of February was marked by a storm of hurricane intensity. The thermometer rose to plus 41° F; rain fell in torrents, partially flooding Redcliffe, and even up on the ice cap, 2,600 feet above the sea level, where Dr. Cook, Astrup and myself had gone to greet the sun, rain fell for several hours. Early in March hunting parties were again sent out, and added ten more deer to our stock. Just after this, nearly all of my party and several of the natives then gathered about the house, were attacked by the grippe. April 18th, I started with Mrs. Peary, Gibson and my native driver for a round of calls among my Eskimo neighbors, and a tour of the unexplored recesses of Inglefield Gulf. From the settlement on Northumberland Island, Gibson returned to Redcliffe

with a load of dog food and several dogs which I had purchased; Mrs. Peary and myself went on.

The round of Inglefield Gulf was completed in six and a half days, during which time I discovered and named over thirty glaciers, at least ten of which are of the first magnitude. I doubt if any other known region shows glacial phenomena of such magnitude and variety as the shores of this body of water. On the last day of April, Dr. Cook, Gibson and Astrup, with five natives and eight dogs, started to the head of McCormick Bay, to get the inland ice supplies up the bluffs. May 3rd, I followed them with Matt and twelve dogs, leaving Verhoeff at Redcliffe to continue his meteorological and tidal observations, in which he had become intensely interested. Four days later, Matt returned to Redcliffe. A week of hardest work was consumed in transporting my supplies up hill and down hill, across the succession of great ice domes intervening between the shore and the edge of the true inland ice, fifteen miles distant.

On the 15th of May, the actual start may be said to have been made. My course was northeast true, which, assuming the charts to be correct, should enable me to clear the heads of the Humboldt, Petermann and Sherard Osborne indentations. Advancing on this course, much to my surprise, I found myself almost immediately on the divide, at an elevation of somewhat less than 5,000 feet, and gradually descending toward the Humboldt Glacier Basin. Hardly had I lost sight of the Whale Sound land before the distant peaks of the Rensselaer Harbor coast rose into view.

After a gradual descent to an elevation of about 3,500 feet the surface of the ice became nearly constant as to elevation across the Humboldt Glacier plateau.

On the 24th of May, at a distance of 130 miles from McCormick Bay, all my boys having volunteered to accompany me, I selected Astrup as my companion for the long journey, and Gibson and Cook returned to Redcliffe. Two marches beyond this we began climbing again and on the last day of June had passed out of the Humboldt depression, and from the plateau southeast of Petermann, at an elevation of 4,200 feet, looked down upon the head of that Fjord and the great glacier discharging into it. Still ascending, we reached the summit at an elevation of 5,700 feet, June 5th, and then began descending into the St. George and Sherard Osborne depressions. Unfortunately, the next two marches were made in cloudy weather, and I got too deeply into the depression, and too near the center of

ice movement. As a result, about ten days were lost in getting out again, and back on to the crevasse-free level heights farther inland.

Again setting my course to the north and northeast everything went smoothly until the 26th of June. On this day I was discouraged to see the land, which had been occasionally visible in the northwest, rise into view to the north, and then northeast. Then the northwest entrance of a Fjord came into view, and we could trace its course southeasterly just beyond the nearer mountains of the land north and northeast. I changed my course to east, when I was soon confronted by the land and the Fjord beyond. Then I turned to the southeast, and travelled in that direction until the first of July. A wide break in the land beyond the Fjord opened out to the northeast, and I immediately headed for it. Land was reached just before midnight of the 1st. On the 4th of July Astrup and myself, having travelled some twenty-five miles over the coast land, came out upon a vertical cliff about 3,500 feet high, and saw below us the white expanse of the great bay into which the Fjord debouched. This bay opened out to the northeast, and its distant northern shore was free of snow and ice. In honor of the day, dear to all of us, I named this bay Independence. Just to the east of my observation spot, a huge glacier flowing due north discharged into the bay. At its narrowest part, where vertical cliffs squeeze it together, this glacier is ten to twelve miles wide, but the periphery of its fan-shaped face in the bay, is not less than twenty miles in extent. This glacier I have named the Academy Glacier.

July 7th, we were back at the edge of the inland ice, and on the 8th began our uneventful return journey. Bearing more to the south into the interior, in order to avoid the obstacles near the coast, in four marches we were on the great central plateau, cloud-capped and deep with snow. Here, at an average elevation of about 8,000 feet, we travelled for two weeks, then bearing to the westward, came down to the 5,000 feet level east of the Humboldt Glacier, and thence parallel to the outward route to the head of McCormick Bay. Just before midnight of August 5th, we met Professor Heilprin and his party, some ten miles from the edge of the ice, and early in the morning of Saturday the 6th, we touched the shore of McCormick Bay.

Monday, the "Kite" steamed down to Redcliffe. The next day I started up Whale Sound in one of my boats to get some tents and sledges which I had purchased of the natives. A continuance of

stormy weather detained me eight days on this trip, and when I returned I found that Verhoeff was missing. A vigorous and systematic search was at once instituted and prosecuted by the members of Professor Heilprin's and my own party, assisted by the crew of the "Kite," and all the able-bodied male natives at Redcliffe. The results of the search, the finding of minerals left by Verhoeff and his tracks leading to a great glacier where all further trace of him was lost, are already familiar to the Academy. August 24th, the "Kite" left McCormick Bay, and September 23rd the North Greenland Expedition had the pleasure of setting foot upon native soil again in Philadelphia.

The principal geographical results of the Expedition may be briefly summarized as follows:

The delineation of the unknown shores of Inglefield Gulf, and the imperfectly known shores of Whale Sound.

The delineation of the northern extension of the great Greenland inland ice cap, and the determination of the northern limit of the main Greenland land mass. The existence of detached ice-free land masses of less extent to the northward.

The rapid convergence of the Greenland shores above the 78th parallel.

The determination of the relief of an exceptionally large area of the inland ice.

The discovery of a large number of glaciers of the first magnitude.

Geological results go hand in hand with the geographical ones, and are comprised in the additions to our knowledge of the inland ice, and the large series of views showing the physical characteristics of the ice-free land, both in the north and about Whale Sound and Inglefield Gulf. These will, in due time, be placed in the hands of the Academy. All this material bears directly on the problem of the great ice age.

In the field of ethnology, the expedition has had exceptional opportunities and has obtained unique material. Dr. F. A. Cook, the ethnologist of the expedition, has obtained a complete census of the isolated little community of Smith's Sound Eskimos, with the relationships of every individual, and anthropometrical measurements of seventy-five individuals.

With Dr. Cook's assistance, I have photographed the same seventy-five, and shall obtain complete sets, consisting of front, side, and rear elevations of between fifty and sixty individuals of both sexes

and all ages. I feel that this material will answer the interesting question, "Whence came these strange people?"

The mineralogical, botanical, and ornithological material is, perhaps, of not more than usual interest, though there are some rare specimens in the latter department, obtained by Mr. Gibson. Field notes, and lists of specimens in these branches, will be sent the Academy as soon as they can be put into shape.

The meteorological and tidal observations by Mr. Verhoeff are among the most complete and painstaking ever made in the Arctic regions. These will be put in the Academy's possession as soon as practicable. An independent set of four-hourly tidal and weather observations, kept by each officer of the watch, will prove of value in connection with the above.

While I have found no time, as yet, to digest and discuss with care my own observations of the inland ice, I feel justified in advancing even now, the following statements for the information of the Academy:

The inland ice of Greenland between the 78th and 82nd parallels is identical in all its characteristics with the inland ice under the 70th parallel east of Disco Bay.

The great glaciers of the northern and northwestern Fjords, of which the Academy Glacier is a magnificent example, have all the external features indicating resistless force and high velocity common to the glaciers of Disco Bay and Omenak Sound, as well as those of Inglefield Gulf.

Under normal conditions the wind of the great ice cap is always blowing from the interior outward and downward, perpendicular to the general trend of the coast.

In all discussions of those agencies which tend to balance the annual precipitation and prevent the rapid increase of the interior ice cap, the agency of the wind, ceaselessly hurrying the snow from the interior to the coast land-ribbon where it can melt, must be placed on a par with the agency of the glacier, in evaporation and sub-glacial liquefaction.

As regards methods and equipment, and their bearing upon future Arctic work, it may be claimed that the North Greenland Expedition has demonstrated that an itinerary upon the inland ice of Greenland may be laid out and carried into effect with nearly, it not quite, the same precision as the time-schedule of a freight train on any of our great railroads; and Professor Heilprin has shown that, with a

proper vessel, the dates from here to Whale Sound may be counted upon with as much certainty as those for any sea voyage of equal length. It has also been demonstrated that any portion of the Greenland coast can be commanded by two or three properly equipped men.

The report would be incomplete without an acknowledgment of my obligations to the members of my party: To Verhoeff, not only for his generous financial assistance to the enterprise, but for his absorbing interest and painstaking work in the field of meteorological and tidal observations entrusted to his care. To Gibson, strong and alert, quick with rifle and gun, the ornithologist and Nimrod of the party. To Dr. Cook, patient and skilful surgeon, indefatigable worker, earnest student of the peculiar people among whom we lived; he has obtained, I believe, a record of the tribe, unapproachable in ethnological archives. To Astrup, a young Hercules, fit descendant of the Vikings, almost a boy, yet with all a man's grit and endurance, his handsome face was never other than a pleasant sight to me, even under the most accentuated circumstances of monotony and fatigue. To Matt, my colored boy, a hard and faithful worker, and second only to Gibson in the trophies of the hunt. He deserves more credit, perhaps, than any other in joining the expedition, belonging, as he did, to a race supposed to be ill fitted for cold regions, and leaving behind him a young bride. To Professor Heilprin, and the members of the Relief Expedition, I am under obligation for many an act of courtesy, and many an hour of pleasant companionship.

Finally, I desire to thank the Academy most sincerely for the quick and efficient interest and assistance with which it honored my project less than two years ago, and for its jealous care for the safety of the expedition, resulting in the despatch of the "Kite" northward last summer, thus relieving my party of the last possible element of serious hardship. I assure the Academy that my personal gratification in having been enabled to carry out the plans of the expedition to the letter has been enhanced by the feeling that this good fortune is equally gratifying to my fellow members.

R. E. PEARY,
Civil Engineer, U. S. Navy.